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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.      | CONFIRMATION NO. |
|--|-------------|----------------------|--------------------------|------------------|
| 09/698,395   | 10/27/2000  | Brian James Andonian | VGT 0143 PUS             | 5399             |
| 7590   | 01/29/2004  |                      | EXAMINER                 |                  |
| John A. Artz<br>Artz & Artz, PC<br>Suite 250<br>28333 Telegraph Road<br>Southfield, MI 48034 |             |                      | PALADINI, ALBERT WILLIAM |                  |
|  |             |                      | ART UNIT                 | PAPER NUMBER     |
|  |             |                      | 2125                     | 3                |
| DATE MAILED: 01/29/2004  |             |                      |                          |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                   |                       |
|------------------------------|-------------------|-----------------------|
| <b>Office Action Summary</b> | Applicant No.     | Applicant(s)          |
|                              | 09/698,395        | ANDONIAN, BRIAN JAMES |
|                              | Examiner          | Art Unit              |
|                              | Albert W Paladini | 2125                  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 27 October 2000.

2a) This action is FINAL.                            2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-23 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) The translation of the foreign language provisional application has been received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) Notice of References Cited (PTO-892)                            4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)                    5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.                    6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Lines 20-23 on page 5 state "The steering feel control processor 22 uses information by the vehicle dynamic sensors 26 to determine an appropriate feedback torque or 'road feel.'" This is a "simulated steering feel system," Vehicle dynamic sensors would be used in a real situation with a real vehicle. If the vehicle is being driven, the steering wheel will, by definition, be providing a real feel. Since the vehicle is actually moving, the steering wheel is providing real "feel" feedback. Dynamic sensors would be redundant, and not as accurate as the actual feel of the wheel under dynamic conditions.

Appropriate correction and clarification is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements and structural cooperative relationships between elements, such omission amounting to a gap between the necessary elements and structural connections. See MPEP § 2172.01.

### **Claim 1**

The “servo disk motor” imparts “feedback torque to an input device.” In order for there to be feedback, there must be an initial signal from some initial controlling device. The controlling device is not recited, and there is no recitation of what it controls. It is also not understood how the “input device” or any of the elements recited provide a “simulated steering feel.” The feedback loop is not recited.

### **Claim 12**

It is assumed that the torque multiplier is connected to the servo disk motor, and also attached to the steering wheel. However, there is no element which generates a “road feel” nor is there any indication of how this is created. A servo generally provides feedback as a result of an original signal. No element is recited which generates the original signal, nor is the feedback loop recited.

Appropriate correction and clarification is required.

5. Claims 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

### **Claim 21**

It is not understood what “an appropriate feedback torque” means. The step of determining a feedback implies one or more steps of sensing an original torque signal, but none have been recited. The claim does not recite what “appropriate” means. It is also not understood how the undefined feedback torque creates a “stimulated steering feel.”

Appropriate correction and clarification is required.

6. Claims 10, 15, and 20 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

### **Claims 10, 15, and 20**

These claims recite either a “dynamic sensor” or “vehicle dynamic characteristics. The claims recite simulation. Vehicle dynamic sensors would be used in a real situation with a real vehicle. If the vehicle is being driven, the steering wheel will, by definition, be providing a real feel. Since the vehicle is actually moving, the steering

wheel is providing real "feel" feedback. Dynamic sensors would be redundant, and not as accurate as the actual feel of the wheel under dynamic conditions.

Appropriate correction and clarification is required.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moncrief (4949119).

This rejection is made to the extent that the claims are understood by addressing the specific elements recited, and by speculatively inferring how they might be logically combined to achieve the perceived objective.

Moncrief teaches a simulated steering feel system on lines 40-60 in column 1, where he states "A driving simulator with feedback forces to a steering wheel is taught in "The Automobile Driving Simulator For Anthropogenic Research" by E. Donges published as report No. FB-41 in Forschungsinstitut Fuer Anthropotechnik in July, 1978. A vehicle simulator by McFadden Systems Inc. of Santa Fe Springs, Calif. includes a steering control torque loader for real time changes in "feel" torque to be programmed into the steering wheel loader. The system consists of a DC servo unit, torque cell, servo controller, power amplifier and cables. The torque cell provides feedback for a torque servo. The servo controller/power amplifier unit contains electronic servo compensation and power amplification to drive the DC torque motor. Spring gradient variations can be made in real time via host computer commands. This steering wheel loader has been installed in the driving simulator of a major automotive manufacturer to evaluate drive/vehicle performance over a wide variety of road conditions."

Some of the added limitations in the independent claims such as the "torque multiplier" are not addressed because it would not be possible for one of ordinary skill in the art to add elements to an incomplete system where the basic elements of the independent claims do not function cooperatively in a logical manner.

#### ***Relevant Prior Art***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wright (5273129) discloses a vehicle steering system where a reaction to the driver's demand is provided by a feel actuator. To do this, a microprocessor interprets the information supplied by a torque sensor and sends a control signal to a servo-valve of the feel actuator to apply hydraulic pressure to the piston heads. This is used to provide resistance to movement of an input rack, which is connected to the steering wheel, and to generally simulate the "feel" of steering. Factors such as inertia, damping, load/displacement, stiffness, backlash, velocity limits and breakout force characteristics are taken into consideration by a microprocessor which sends its control signals to the feel actuator to provide a safe steering system suited to the driver.

Bohner (5803202) discloses a reaction simulator for a vehicle steering system where a rotationally elastic hub simulates, under all conditions, the elasticity of the power transmission components between the steering wheel and the steered wheels present in conventional steering systems. Generally, rotational movement of the shaft is transmitted to a position value sensor transmitter and, by way of a control circuit, a servo unit to follow the rotation of the steering wheel essentially without delay operates the steered wheels of the vehicle.

Unbehand (5823876) discloses a steering simulation assembly, and states on lines 30-65 in column 1 that "Perhaps, the first successful effort to provide realistic "feel" in a student pilot vehicle simulator appears to have been achieved by Paul E. Grandmont in 1950. In that year, he filed a patent application and assigned it to the Curtis-Wright Corporation. The application listed many of the objectives to be achieved in order to successfully simulate the "feel" of the opposing force through a control stick. His design utilized a servo-motor operating from signals from a computer to operate a positive displacement double action hydraulic pump. On Sep. 3, 1957, U.S. Pat. No. 2,804,698 was granted to Mr. Grandmont on that invention. In his patent, at col. 1, lines 3 and 23 to 35, he sets forth several of the objectives which have guided simulator builders for the next 56 years. "It has been proposed to apply to the respective simulated aircraft controls of grounded flight trainers, [1.] forces variable according to the simulated airspeed and [2.] to the control displacements, one example being a motor-tensioned spring arrangement for [3.] opposing the control pressure applied by the student pilot. The controls so loaded are intended to simulate in operation actual aircraft controls, namely the aileron, elevator and rudder controls which tend [4.] to be centered by air resistance at the control

surfaces, this resistance being primarily a [5.] function of airspeed. In general, the prior art devices are complicated and not sufficiently [6.] accurate throughout the required [7.] range of operation to make realistic the [8.] control "feel" for certain types of aircraft, particularly the high-speed aircraft wherein a greater degree of fidelity in control loading simulation is required within a narrow range near the neutral position of the control. That is, in a case of high speed aircraft the air resistance loading for comparatively small control displacements may be considerable and the normal range of control movement is restricted as compared with low-speed aircraft. Also, in the prior art devices the control "feel" may be unnatural by reason of [8.] inertia effects, [9.] servo response and related factors."

10. Any inquiry concerning this communication or earlier communication from the examiner should be direct to Albert W. Paladini whose telephone number is (703) 308-2005. The examiner can normally be reached from 7:30 to 3:30 PM on Monday, Tuesday, Thursday, and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Leo P. Picard, can be reached on (703) 308-0538. The official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

January 22, 2004

  
Albert W. Paladini  
Primary Examiner  
Art Unit 2125